

Internal Cabling Guide for HP Smart Array Controllers

HP Integrity Servers with Microsoft® Windows® Server 2003



Manufacturing Part Number: 5990-8235

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1 Cabling for the HP Integrity rx8620 Server

This chapter describes how to connect the cables of an HP Smart Array 5302 or 5304 controller card to the internal hard drives of an HP Integrity rx8620 Server.

NOTE

These instructions do not apply if you are connecting the controller card to an external mass storage box. Refer instead to the *HP Smart Array Controller User Guide* that shipped with your card.

The Smart Array 5300 series of controller cards includes two models: the 5302 and the 5304. Model 5302 has two Wide Ultra160 SCSI channels and 128 MB of cache. Model 5304 has four Wide Ultra160 SCSI channels and 256 MB of cache.

The product numbers and descriptions for these two cards are summarized as follows:

Table 1-1

Controller	Product Number	Description
SA5302	A9825A	2 channel / 128 MB cache
SA5304	A9826A	4 channel / 256 MB cache

Before you begin, you will need:

- cable kit (part number: A7027-63001)
- the Smart Array controller card (see Figure 1-1 and Figure 1-2)

Figure 1-1 Smart Array 5302 controller card

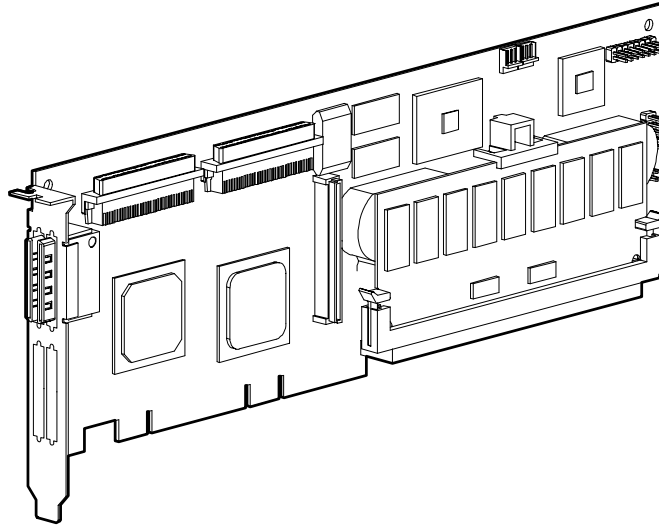
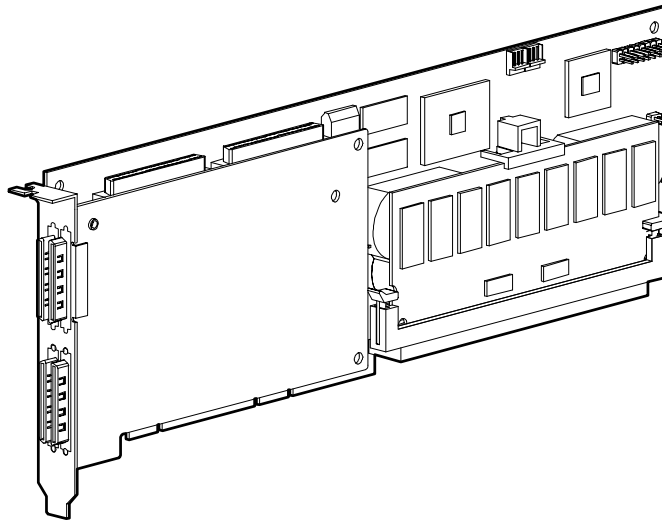


Figure 1-2 Smart Array 5304 controller card



Installing the HP Smart Array 5302 or 5304 controller card

- Step 1.** If the server is running, shut down the OS, power off the server, and unplug the power cord.
- Step 2.** Remove the top cover of the server.

- Step 3.** The HP Smart Array 5302 or 5304 controller card must be installed in PCI slot 8 for internal RAID. If another PCI card is located in slot 8, remove that card and relocate it to another slot. Do this by twisting the blue paddle that locks the card in place by the bulkhead (see Figure 1-3). Once the card is unlatched, pull the tabs on the insulator/dividers to unseat the card. Then insert the 5302 or 5304 controller card into the empty slot.

Figure 1-3 Paddles holding the cards in place



- Step 4.** Once the card is installed, proceed to the next section.

Recabling for RAID

From the factory, the internal hot plug drives for the HP Integrity rx8620 server are connected to the integrated SCSI card as follows (when viewed from the front of the server):

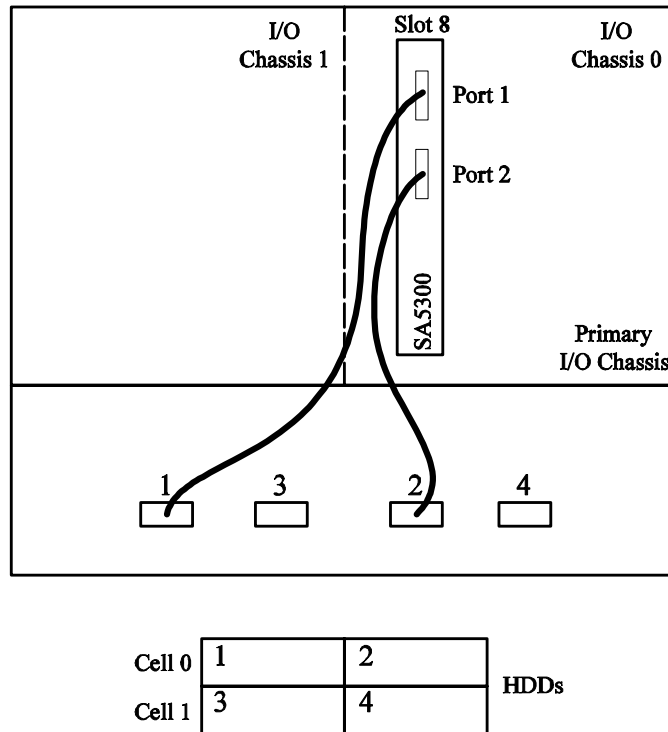
- the top left hard drive has a SCSI connector cabled to the internal SCSI cell 0
- the top right hard drive has a SCSI connector cabled to the internal SCSI cell 0
- the bottom left hard drive has a SCSI connector cabled to the internal SCSI cell 1
- the bottom right hard drive has a SCSI connector cabled to the internal SCSI cell 1

To use RAID with your hot plug drives, you must disconnect the internal SCSI cables from their embedded controller and use the Cable kit (A7027-63001). Then follow the appropriate set of instructions given below.

Single Partition Configuration

Figure 1-4 shows the correct cabling for a single partition configuration, as viewed from the front of the server.

Figure 1-4 Smart Array 5302 or 5304 controller card with single partition cabling



Setting up RAID cabling on the top left and top right hot plug hard drives

To set up the RAID cabling on the top left and top right hot plug hard drives, do the following, from the front of the server:

- Step 1.** Be sure the HP Smart Array 5302 or 5304 controller card is installed in PCI slot 8 of the Primary I/O Chassis (I/O Chassis 0). Refer to the *HP Smart Array 5300 User Guide*.
- Step 2.** Retrieve two cables from the cable kit (A7027-63001).
- Step 3.** Identify the new cables using the colored cable ties which are also contained in the cable kit (for each cable, use two of the same color, one on each end).
- Step 4.** Plug the end of one of the cables with the pull-tab into the SCSI connector Port 1 on the Smart Array card (Port 1 is near the bracket). Repeat for SCSI connector Port 2 (Port 2 is near the center of the board).
- Step 5.** Route the other end of the cables out through the left hand side of the server.
- Step 6.** Route the cables towards the front of the server and over to the mass storage connectors.
- Step 7.** Unplug the existing SCSI ribbon cable for the top left HDD (use the label behind the connectors to determine which connector goes to which drive).

- Step 8.** Plug the new cable from the Smart Array card Port 1 into the mass storage connector for the top left drive.
- Step 9.** Unplug the existing SCSI ribbon cable for the top right HDD (use the label behind the connectors to determine which connector goes to which drive).
- Step 10.** Plug the new cable from the Smart Array card Port 2 into the mass storage connector for the top right drive.
- Step 11.** Arrange the new cable so that all of the slack is located in the PCI area.
- Step 12.** Fold the cable slack and wrap a Kwik Wrap around it to maintain the slack (this allows servicing of the other PCI cards).
- Step 13.** Leave the un-plugged SCSI ribbon cable to rest just in front of the SCSI connector.

The cabling should look like this when finished:

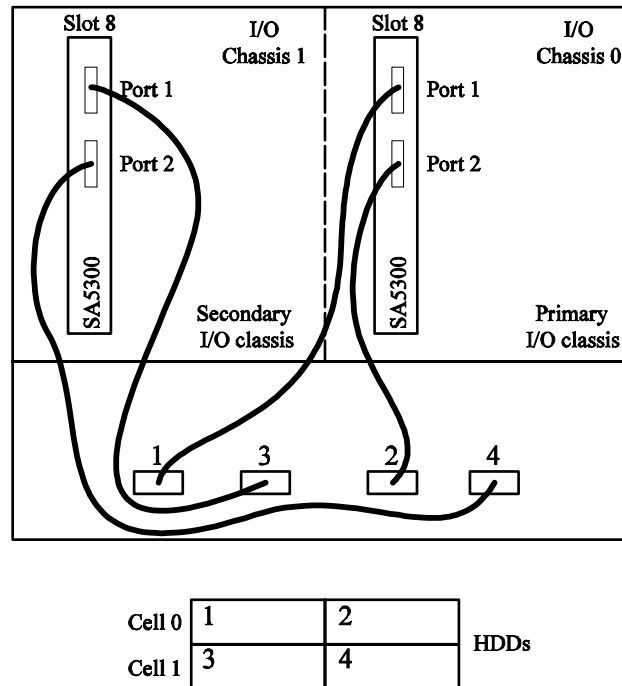
Figure 1-5 Smart Array 5302 or 5304 controller card with single partition cabling



Dual Partition Configurations

Figure 1-6 shows the correct cabling for a dual partition configuration, as viewed from the front of the server.

Figure 1-6 Smart Array 5302 or 5304 controller card with dual partition cabling



Setting up RAID cabling on the top right and top left hot plug hard drives

To set up the RAID cabling on the top right and top left hot plug hard drives, do the following, from the front of the server:

- Step 1.** Be sure the HP Smart Array 5302 or 5304 controller card is installed in PCI slot 8 of the Primary I/O Chassis (I/O Chassis 0). Refer to the *HP Smart Array 5300 User Guide*.
- Step 2.** Retrieve two cables from the cable kit (A7027-63001).
- Step 3.** Identify the new cables using the colored cable ties which are also contained in the cable kit (for each cable, use two of the same color, one on each end).
- Step 4.** Plug the end of one of the cables with the pull-tab into the SCSI connector Port 1 on the Smart Array card (Port 1 is near the bracket). Repeat for SCSI connector Port 2 (Port 2 is near the center of the board).
- Step 5.** Route the other end of the cables out through the left hand side of the server.
- Step 6.** Route the cables towards the front of the server and over to the mass storage connectors.
- Step 7.** Unplug the existing SCSI ribbon cable for the top left HDD (use the label behind the connectors to determine which connector goes to which drive).
- Step 8.** Plug the new cable from the Smart Array card Port 1 into the mass storage connector for the top left drive.

- Step 9.** Unplug the existing SCSI ribbon cable for the top right HDD (use the label behind the connectors to determine which connector goes to which drive).
- Step 10.** Plug the new cable from the Smart Array card Port 2 into the mass storage connector for the top right drive.
- Step 11.** Arrange the new cable so that all the slack is located in the PCI area.
- Step 12.** Fold the cable slack and wrap a Kwik Wrap around it to maintain the slack (this allows servicing of the other PCI cards).
- Step 13.** Leave the un-plugged SCSI ribbon cable to rest just in front of the SCSI connector.

Setting up RAID cabling on the bottom left and bottom right hot plug hard drives

To set up the RAID cabling on the bottom left and bottom right hot plug hard drives, do the following, from the front of the server:

- Step 1.** Be sure the HP Smart Array 5302 or 5304 controller card is installed in PCI slot 8 of the Secondary I/O Chassis (I/O Chassis 1). Refer to the *HP Smart Array 5300 User Guide*.
- Step 2.** Retrieve two cables from the cable kit (A7027-63001).
- Step 3.** Identify the new cables using the colored cable ties which are also contained in the cable kit (for each cable, use two of the same color, one on each end).
- Step 4.** Plug the end of one of the cables with the pull-tab into the SCSI connector Port 1 on the Smart Array card (Port 1 is near the bracket). Repeat for SCSI connector Port 2 (Port 2 is near the center of the board).
- Step 5.** Route the other end of the cables out through the left hand side of the server.
- Step 6.** Route the cables towards the front of the server and over to the mass storage connectors.
- Step 7.** Unplug the existing SCSI ribbon cable for the bottom left HDD (use the label behind the connectors to determine which connector goes to which drive).
- Step 8.** Plug the new cable from the Smart Array card Port 1 into the mass storage connector for the bottom left HDD.
- Step 9.** Unplug the existing SCSI ribbon cable for the bottom right HDD (use the label behind the connectors to determine which connector goes to which drive).
- Step 10.** Plug the new cable from the Smart Array card Port 2 into the mass storage connector for the bottom right HDD.
- Step 11.** Arrange the new cable so that all the slack is located in the PCI area.
- Step 12.** Fold the cable slack and wrap a Kwik Wrap around it to maintain the slack (cable slack allows for the servicing of other PCI cards).
- Step 13.** Leave the un-plugged SCSI ribbon cable to rest just in front of the SCSI connector.

The cabling should look like this when finished:

Figure 1-7 Smart Array 5302 or 5304 controller card with dual partition cabling



NOTE When cabling the HP Smart Array 5302 or 5304 controller card to the Server Expansion Unit (SEU), the PCI-X I/O and SCSI HDD Backplane architecture are identical between the rx8620 server and the Server Expansion Unit. Therefore, to recable the Server Expansion Unit for RAID, please follow the instructions above that were used for recabling the rx8620 server. Adding the Server Expansion Unit allows for a 3-partition or 4-partition configuration.

Insight Manager 7 hard disk drive mapping

The previously described internal drive configuration produces the following mapping in IM7 when events occur on a target HDD:

Table 1-2

SA5302 or 5304 Card Location				HDD Identification				HDD Location
Cabinet	I/O Bay	I/O Chassis	Slot	Cabinet	Cell	Port	SCSI ID	Physical Drive
0	0	0	8	0	0	1	6	rx8620 Top Left
0	0	0	8	0	0	2	6	rx8620 Top Right

Table 1-2 (Continued)

SA5302 or 5304 Card Location				HDD Identification				HDD Location
Cabinet	I/O Bay	I/O Chassis	Slot	Cabinet	Cell	Port	SCSI ID	Physical Drive
0	0	1	8	0	1	1	6	rx8620 Bottom Left
0	0	1	8	0	1	2	6	rx8620 Bottom Right
8	0	0	8	8	2	1	6	SEU Top Left
8	0	0	8	8	2	2	6	SEU Top Right
8	0	1	8	8	3	1	6	SEU Bottom Left
8	0	1	8	8	3	2	6	SEU Bottom Right

Configuring the server firmware and software for RAID

To complete the installation and set up RAID for your server's internal hot swap drives, follow the procedures given in the *Smart Array 5300 Controller User Guide*:

- Configure your HP Smart Array 5302 or 5304 controller card in an HP Integrity server (use HP Smart Array 5300 utilities and command line options from the EFI shell)
- Install and use the operating system-specific HP Smart Array 5300 utilities and software that help you manage your RAID
- Configure the HP Smart Array 5302 or 5304 controller card for an external RAID storage system

2 Cabling for the HP Integrity rx7620 Server

This chapter describes how to connect the cables of an HP Smart Array 6402 or 6404 controller card to the internal hard drives of an HP Integrity rx7620 Server.

NOTE

These instructions do not apply if you are connecting the controller card to an external mass storage box. Refer instead to the *HP Smart Array Controller User Guide* that shipped with your card.

The Smart Array 6400 series of controller cards includes two models: the 6402 and the 6404. Model 6402 has two Wide Ultra320 SCSI channels and 128 MB of cache. Model 6404 has four Wide Ultra320 SCSI channels and 256 MB of cache.

The product numbers and descriptions for these two cards are summarized as follows:

Table 2-1

Controller	Product Number	Description
SA6402	A9890A	2 channel / 128 MB cache
SA6404	A9891A	4 channel / 256 MB cache

Before you begin, you will need:

- cable kit (part number: A7027-63001)
- T-15 Torx driver
- 3/16-inch hex driver
- the Smart Array controller card (see Figure 2-1)

Figure 2-1 Smart Array 6402 controller card (6404 not shown)

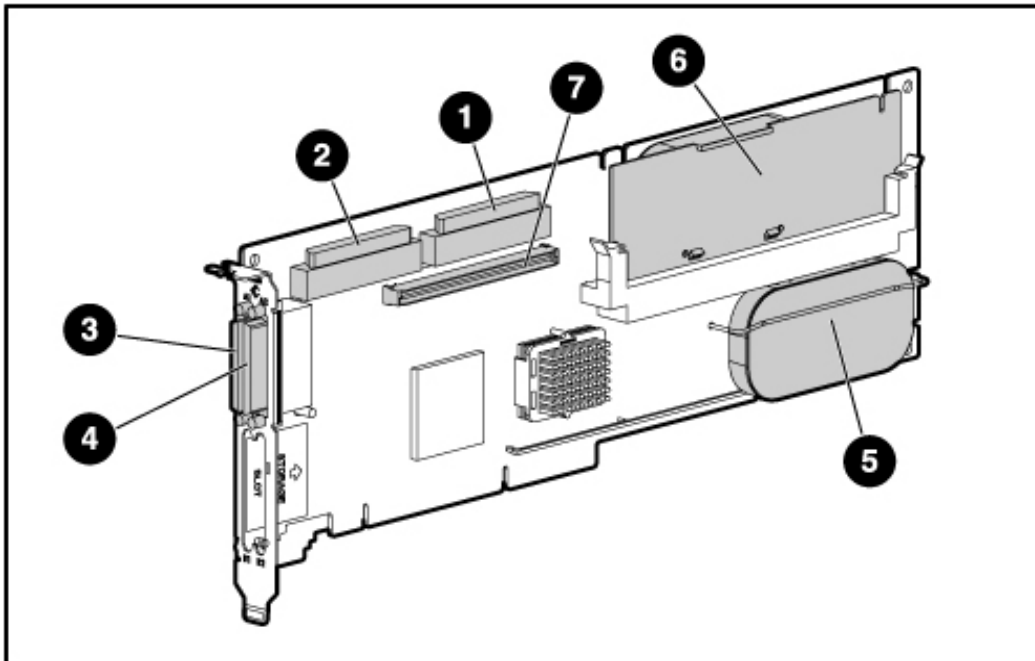


Table 2-2

Item ID	Description
1	Internal SCSI connector, port A1*
2	Internal SCSI connector, port A2*
3	External SCSI connector, port A1*
4	External SCSI connector, port A2*
5	Controller battery
6	Battery-backed cache module
7	Connector for expansion board
* NOTE: Do not use both connectors on a port simultaneously.	

Installing the HP Smart Array 6402 or 6404 controller card

- Step 1.** If the server is running, shut down the OS, power off the server, and unplug the power cord.
- Step 2.** Remove the top cover of the server.

- Step 3.** The HP Smart Array 6402 or 6404 controller card must be installed in PCI slot 0-8 or 1-7 for internal RAID (the Procurium card is embedded in slot 1-8, and slot 0-1 if a second Procurium card is ordered). If another PCI card is located in slot 0-8 or 1-7, remove that card and relocate it to another slot. Do this by twisting the blue paddle that locks the card in place by the bulkhead (see Figure 2-2). Once the card is unlatched, pull the tabs on the insulator/dividers to unseat the card. Then insert the 6402 or 6404 controller card into the empty slot.

Figure 2-2 Paddles holding the cards in place



- Step 4.** Once the card is installed, proceed to the next section.

Recabling for RAID

From the factory, the internal hot plug drives for the HP Integrity rx7620 server are connected to the integrated SCSI card as follows (when viewed from the front of the server):

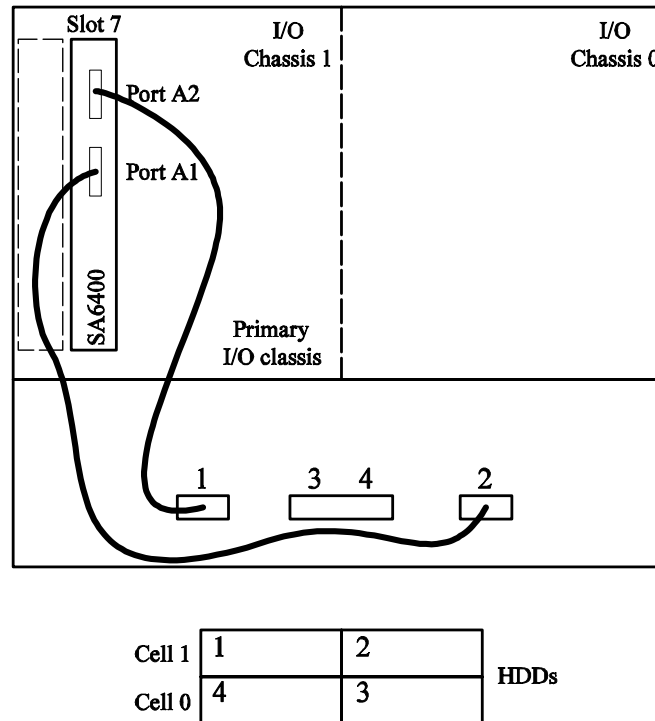
- the top left hard drive has a SCSI connector cabled to the management processor (MP) card
- the top right hard drive has a SCSI connector cabled to the Core I/O slot 8 cell 1
- the bottom left and right hard drive has a SCSI connector cabled to internal SCSI cell 0

To use RAID with your hot plug drives, you must disconnect the internal SCSI cables from their embedded controller and use the Cable kit (A7027-63001). Then follow the appropriate set of instructions given below.

Single Partition Configuration

Figure 2-3 shows the correct cabling for a single partition configuration, as viewed from the front of the server.

Figure 2-3 Smart Array 6402 or 6404 controller card with single partition cabling



Setting up RAID cabling on the top left and top right hot plug hard drives

To set up the RAID cabling on the top left and top right hot plug hard drives, do the following, from the front of the server:

- Step 1.** Be sure the HP Smart Array 6402 or 6404 controller card is installed in PCI slot 1-7. Refer to *HP Smart Array 6400 User Guide*.
- Step 2.** Retrieve two cables from the cable kit (A7027-63001).
- Step 3.** Identify the new cables using the colored cable ties which are also contained in the cable kit (for each cable, use two of the same color, one on each end).
- Step 4.** Plug the end of the cable with the pull-tab into the SCSI connector port A1 on the Smart Array card. Repeat for SCSI connector port A2.
- Step 5.** Route the other end of the cables out through the left hand side of the server.
- Step 6.** Route the cables towards the front of the server and over to the mass storage connectors.
- Step 7.** Unplug the existing SCSI ribbon cables for the top left and top right HDDs (use the label behind the connectors to determine which connector goes to which drive).
- Step 8.** Plug the new cable from the Smart Array card Port A2 (closest to the bracket) into the mass storage connector for the top left drive.

- Step 9.** Plug the new cable from the Smart Array card Port A1 (closest to the center of the board) into the mass storage connector for the top right drive.
- Step 10.** Arrange the new cable so that all of the slack is located in the PCI area.
- Step 11.** Fold the cable slack and wrap a Kwik Wrap around it to maintain the slack (this allows servicing of the other PCI cards).
- Step 12.** Leave the un-plugged SCSI ribbon cable to rest just in front of the SCSI connector.

The cabling should look like this when finished:

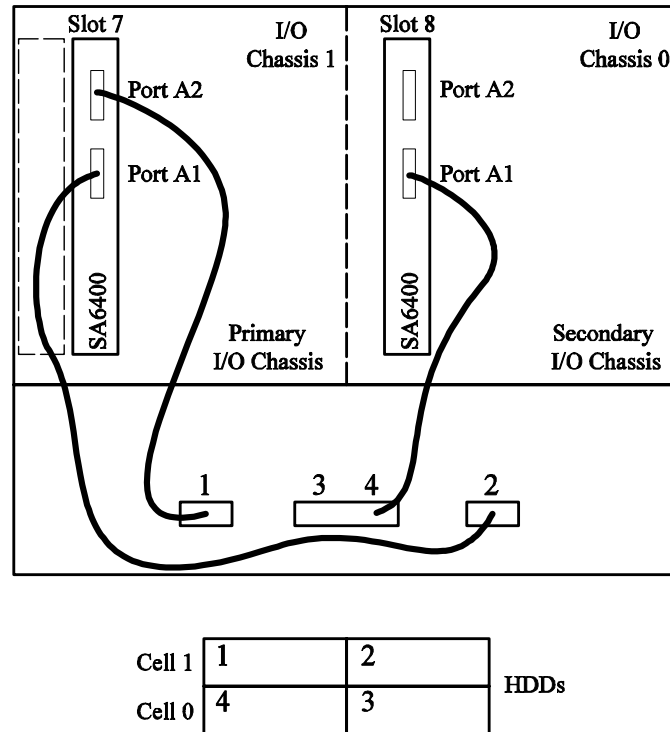
Figure 2-4 Smart Array 6402 or 6404 controller card with single partition cabling



Dual Partition Configurations

Figure 2-5 shows the correct cabling for a dual partition configuration, as viewed from the front of the server.

Figure 2-5 Smart Array 6402 or 6404 controller card with dual partition cabling



Setting up RAID cabling on the top right and top left hot plug hard drives

To set up the RAID cabling on the top right and top left hot plug hard drives, do the following, from the front of the server:

- Step 1.** Be sure the HP Smart Array 6402 or 6404 controller card is installed in PCI slot 1-7. Refer to the *HP Smart Array 5300 User Guide*.
- Step 2.** Retrieve two cables from the cable kit (A7027-63001).
- Step 3.** Identify the new cables using the colored cable ties which are also contained in the cable kit (for each cable, use two of the same color, one on each end).
- Step 4.** Plug the end of the cables with the pull-tab into the SCSI connector port A1 on the Smart Array card. Repeat for SCSI connector port A2.
- Step 5.** Route the other end of the cables out through the left hand side of the server.
- Step 6.** Route the cables towards the front of the server and over to the mass storage connectors.
- Step 7.** Unplug the existing SCSI ribbon cables for the top left and top right HDDs (use the label behind the connectors to determine which connector goes to which drive).
- Step 8.** Plug the new cable from the Smart Array card Port A2 (closest to the bracket) into the mass storage connector for the top left drive.

- Step 9.** Plug the new cable from the Smart Array card Port A1 (closest to the center of the board) into the mass storage connector for the top right drive.
- Step 10.** Arrange the new cables so that all the slack is located in the PCI area.
- Step 11.** Fold the cable slack and wrap a Kwik Wrap around it to maintain the slack (this allows servicing of the other PCI cards).

Setting up RAID cabling on the bottom hot plug hard drives

To set up the RAID cabling on the bottom hot plug hard drives, do the following, from the front of the server:

- Step 1.** Be sure the HP Smart Array 6402 or 6404 controller card is installed in PCI slot 0-8. Refer to *HP Smart Array 6400 User Guide*.
- Step 2.** Retrieve one cable from the cable kit (A7027-63001).
- Step 3.** Identify the new cable using the colored cable ties which are also contained in the cable kit (use two of the same color, one on each end).
- Step 4.** Plug the end of the cable with the pull-tab into the SCSI connector port A1 on the Smart Array card.
- Step 5.** Route the other end of the cable out through the left hand side of the server.
- Step 6.** Route the cable towards the front of the server and over to the mass storage connectors.
- Step 7.** Unplug the existing SCSI ribbon cable for the bottom HDDs (use the label behind the connectors to determine which connector goes to which drive).
- Step 8.** Plug the new cable from the Smart Array card into the mass storage connector for the bottom HDDs.
- Step 9.** Arrange the new cable so that all the slack is located in the PCI area.

Step 10. Fold the cable slack and wrap a Kwik Wrap around it to maintain the slack (this allows servicing of the other PCI cards).

The cabling should look like this when finished:

Figure 2-6 Smart Array 6402 or 6404 controller card with dual partition cabling



Insight Manager 7 hard disk drive mapping

The previously described internal drive configuration produces the following mapping in IM7 when events occur on a target HDD:

Table 2-3

SA6402 or 6404 Card Location				HDD Identification				HDD Location
Cabinet	I/O Bay	I/O Chassis	Slot	Cabinet	Cell	Port	SCSI ID	Physical Drive
0	0	1	7	0	1	2	6	Top Left

Table 2-3 (Continued)

SA6402 or 6404 Card Location				HDD Identification				HDD Location
Cabinet	I/O Bay	I/O Chassis	Slot	Cabinet	Cell	Port	SCSI ID	Physical Drive
0	0	1	7	0	1	1	6	Top Right
0	0	0	8	0	0	1	6	Bottom Left
0	0	0	8	0	0	1	5	Bottom Right

Configuring the server firmware and software for RAID

To complete the installation and set up RAID for your server's internal hot swap drives, follow the procedures given in the *Smart Array 6400 Controller User Guide*:

- Configure your HP Smart Array 6402 or 6404 controller card in an HP Integrity server (use HP Smart Array 6400 utilities and command line options from the EFI shell)
- Install and use the operating system-specific HP Smart Array 6400 utilities and software that help you manage your RAID
- Configure the HP Smart Array 6402 or 6404 controller card for an external RAID storage system

3

Cabling for the HP Integrity rx5670 Server

This chapter describes how to connect the cables of an HP Smart Array 5302 or 5304 controller card to the internal hard drives of an HP Integrity rx5670 Server.

NOTE

These instructions do not apply if you are connecting the controller card to an external mass storage box. Refer instead to the *HP Smart Array Controller User Guide* that shipped with your card.

The Smart Array 5300 series of controller cards includes two models: the 5302 and the 5304. Model 5302 has two Wide Ultra160 SCSI channels and 128 MB of cache. Model 5304 has four Wide Ultra160 SCSI channels and 256 MB of cache.

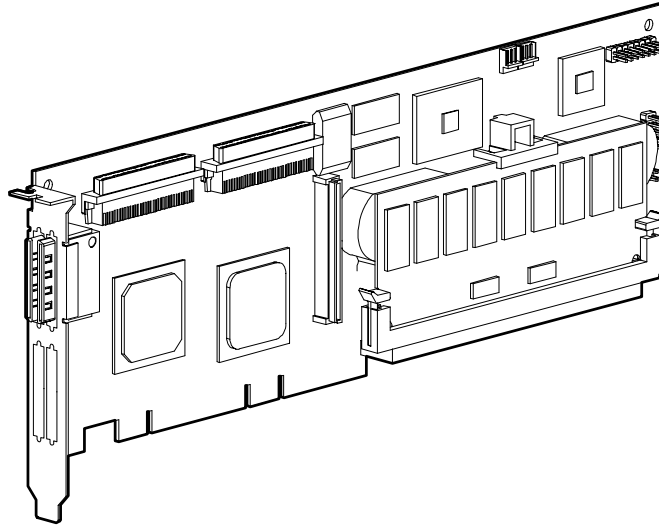
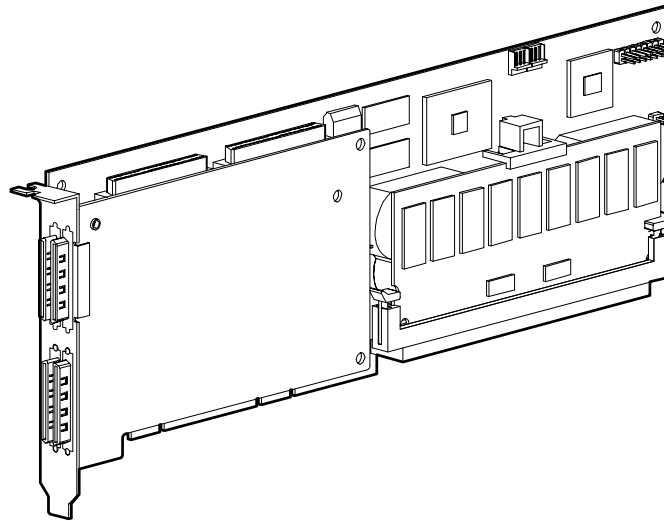
The product numbers and descriptions for these two cards are summarized as follows:

Table 3-1

Controller	Product Number	Description
SA5302	A9825A	2 channel / 128 MB cache
SA5304	A9826A	4 channel / 256 MB cache

Before you begin, you will need:

- the two extension cables included in this kit (part numbers: A9828-63001 and A9828-63002)
- the Smart Array controller card (refer to Figure 3-1 and Figure 3-2)

Figure 3-1 Smart Array 5302 controller card**Figure 3-2 Smart Array 5304 controller card****NOTE**

If an HP Server rx5670 is ordered from the factory along with an internal RAID option (with the HP Smart Array controller card and extension cable A9828-63001 pre-installed), this extension cable connects hot plug drives A and B to PORT 1 of the HP Smart Array controller card installed in PCI slot 4. Refer to Figure 3-5 for the PCI slot location and Figure 3-7 for the physical drive location. The additional cable A9828-63002 is placed in the server top tray. The internal hot plug drives C and D are connected to the internal SCSI adapter in PCI slot 3.

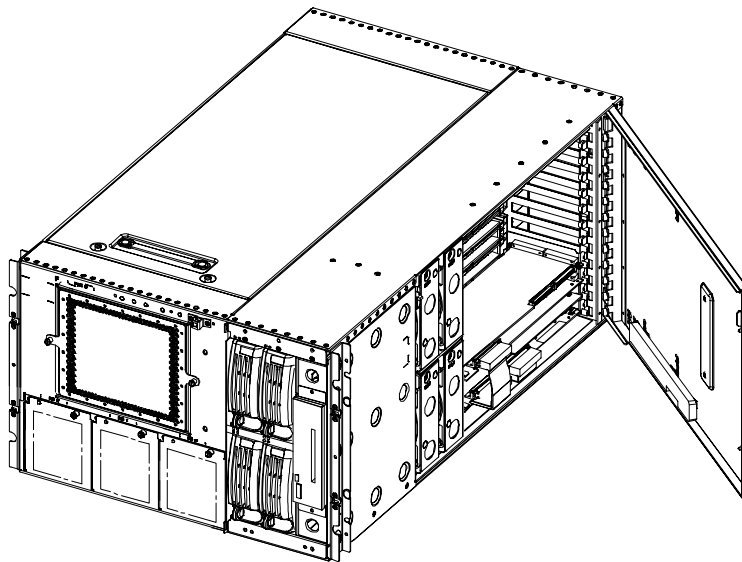
PORT 2 of the HP Smart Array controller card is still be available to connect the external StorageWorks mass storage or internal hot plug drives C and D. If the internal hot plug drives C and D are required for RAID, you will need to install cable A9828-63002 as described in the “Recabling for RAID” section later in this chapter.

If you opt to use both ports of the Smart Array controller card for your internal drives, you must purchase an additional HP Smart Array controller if you want external RAID mass storage.

Installing the HP Smart Array 5302 or 5304 controller card

- Step 1.** If the server is running, shut down the OS, power off the server, and unplug the power cord.
- Step 2.** Remove the side cover of the server:
- Loosen the captive T-15 screws that hold the side cover in place.
 - Grasp the strap handle, pull the side cover slightly away from the server, and pull the cover toward the front of the server to free the cover tabs from the slots in the rear of the chassis (see Figure 3-3).

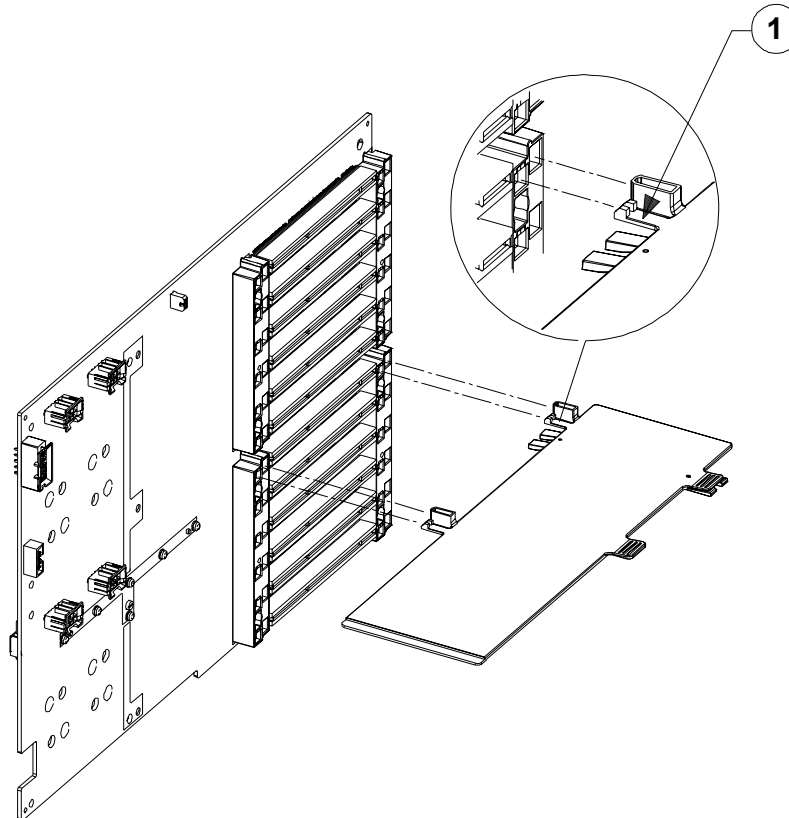
Figure 3-3 Removing the side cover



- Step 3.** The HP Smart Array 5302 or 5304 controller card must be installed in PCI slot 4 for internal RAID. If another PCI card is located in slot 4, remove that card and relocate it to another slot. If the PCI card separator/extractor is in slot 4, remove it as follows:
- Remove the corresponding PCI card.
 - Carefully slide a long-shaft, medium-width, flat-headed screwdriver into the side service bay along the top of the PCI card separator/extractor.

- c. At the point where the PCI card separator/extractor inserts into the PCI backplane connector (Item 1 in Figure 3-4) there are two slotted, hook tab connectors on the PCI card separator/extractor, one on either side of the PCI backplane connector. Press one, then the other, to disengage the separator/extractor from the PCI backplane.
- d. Slide the PCI card separator/extractor out of the PCI card cage.

Figure 3-4 **PCI card separator/extractor**

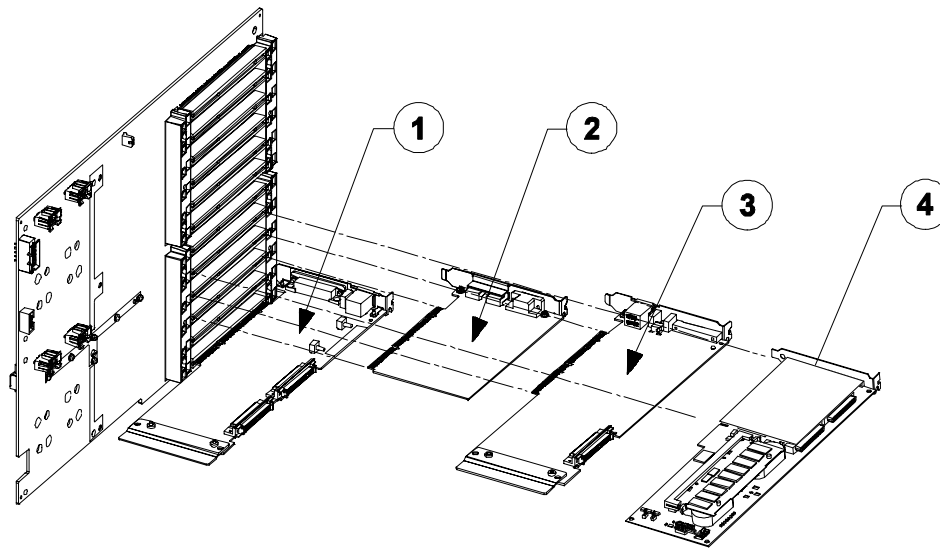


Step 4. Install the HP Smart Array 5302 or 5304 controller card in PCI Slot 4 (see Figure 3-5). When finished, you should have the following cards in the server's first four PCI slots:

- 1. the MP/SCSI board located in PCI slot 1 (Item 1 in Figure 3-5)
- 2. an optional Video board located in PCI slot 2
- 3. the LAN/SCSI board located in PCI slot 3
- 4. the HP Smart Array 5302 or 5304 controller card must be installed in PCI slot 4 for internal RAID

Once the card is installed, proceed to the next section.

Figure 3-5 **PCI card order**



Recabling for RAID

From the factory, the internal hot plug drives for the HP rx5670 server are connected to the integrated SCSI as follows (see Figure 3-6 and Figure 3-7):

- The MP/SCSI board in PCI slot 1 has a SCSI connector cabled to physical drives A and B
- The LAN/SCSI board in PCI slot 3 has a SCSI connector cabled to physical drives C and D

Figure 3-6 Default cabling for internal SCSI hot plug drives

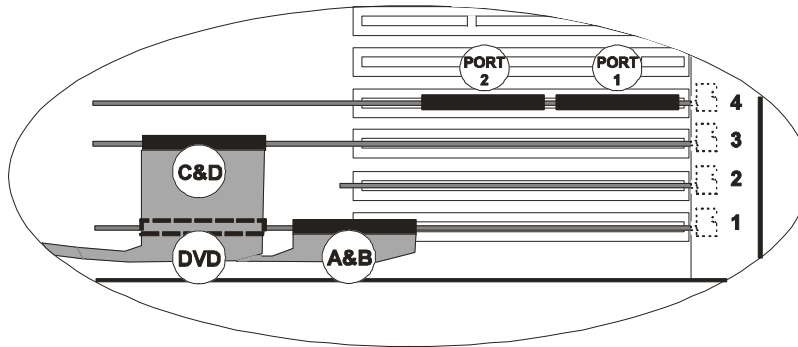
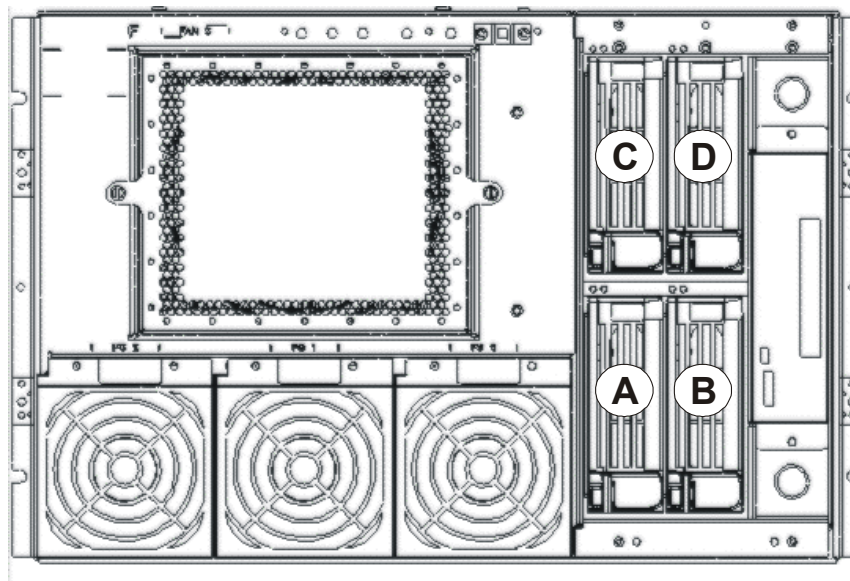


Figure 3-7 Physical drive location (front of the server with bezel removed)



To use RAID with your hot plug drives, you will need to disconnect the internal SCSI cables from their embedded controller and reconnect them to the HP Smart Array 5302 or 5304 controller card using the supplied A9828-63001 and A9828-63002 cables, as described below.

NOTE To connect drives A, B, C, and D, follow all steps in both of the sections described below.

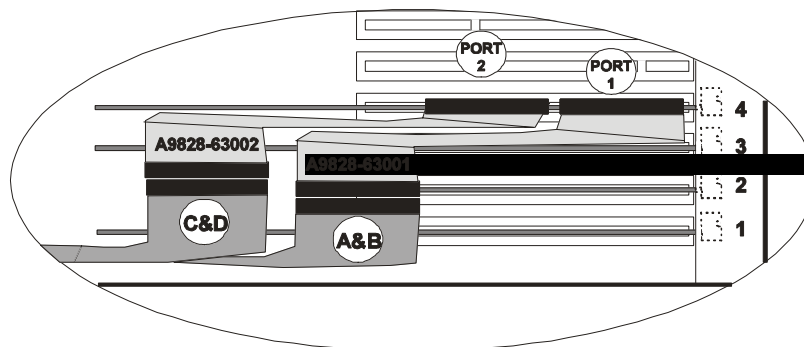
Setting up RAID on hot plug drives A and B

- Step 1.** Verify the HP Smart Array 5302 or 5304 controller card is installed in PCI slot 4. See “Installing the HP Smart Array 5302 or 5304 controller card” on page 28.
- Step 2.** Plug one end of the A9828-63001 cable into the controller card's internal PORT 1 connector. Rout the cable between the card and the side cover (see Figure 3-8).
- Step 3.** Unplug the SCSI cable that connects the A and B hot plug drives to the MP/SCSI board located in PCI slot 1. There are two connectors on the MP/SCSI board. When looking at the MP/SCSI board, as shown in Figure 3-8, the connector towards the rear of the server goes to hot plug drives A and B. The connector towards the front of the server, where the drives are located, is for the DVD drive.
- Step 4.** Take the unplugged SCSI cable and connect it to the A9828-63001 cable (see Figure 3-8). Once the cable is plugged in at both ends, it should be parallel to the side cover.
- Step 5.** If only hot plug drives are required, the setup is complete and you may close the server. Otherwise continue on to the next section.

Setting up RAID on hot plug drives C and D

- Step 1.** Plug one end of the A9828-63002 cable into the controller card's internal PORT 2 connector.
- Step 2.** Unplug the SCSI cable that connects the C and D hot plug drives to the MP/SCSI board located in PCI Slot 3.
- Step 3.** Take the unplugged SCSI cable and connect it to the A9828-63002 cable (see Figure 3-8). Once the cable is plugged in at both ends, it should be parallel to the side cover.
- Step 4.** When finished, close the server.

Figure 3-8 Recabling for RAID



NOTE Once the setup is complete, the cables should be parallel to the side cover.

Configuring the server firmware and software for RAID

To complete the installation and set up RAID for your server's internal hot swap drives, follow the procedures given in the *Smart Array 5300 Controller User Guide*:

- Configure your HP Smart Array 5302 or 5304 controller card in an HP Integrity server (use HP Smart Array 5300 utilities and command line options from the EFI shell)
- Install and use the operating system-specific HP Smart Array 5300 utilities and software that help you manage your RAID
- Configure the HP Smart Array 5302 or 5304 controller card for an external RAID storage system

4 Cabling for the HP Integrity rx2620 and rx2600 Servers

This chapter describes how to connect the cables of an HP Smart Array 5302, 5304, 6402, or 6404 controller card to the internal hard drives of an HP Integrity rx2620 or rx2600 Server.

NOTE

These instructions do not apply if you are connecting the controller card to an external mass storage box. Refer instead to the *HP Smart Array Controller User Guide* that shipped with your card.

The Smart Array 5300 series of controller cards includes two models: the 5302 and the 5304. Model 5302 has two Wide Ultra160 SCSI channels and 128 MB of cache. Model 5304 has four Wide Ultra160 SCSI channels and 256 MB of cache.

The Smart Array 6400 series of controller cards includes two models: the 6402 and the 6404. Model 6402 has two Wide Ultra320 SCSI channels and 128 MB of cache. Model 6404 has four Wide Ultra320 SCSI channels and 256 MB of cache.

The product numbers and descriptions for these four cards are summarized as follows:

Table 4-1

Controller	Product Number	Description
SA5302	A9825A	2 channel / 128 MB cache
SA5304	A9826A	4 channel / 256 MB cache
SA6402	A9890A	2 channel / 128 MB cache
SA6404	A9891A	4 channel / 256 MB cache

Before you begin, you will need:

- cable kit for single channel configuration (part number: A7231-63024), or
- cable kit for dual channel configuration (part number: A7231-63025)
- T-15 Torx driver
- 3/16-inch hex driver
- the Smart Array controller card (see Figure 4-1, Figure 4-2, and Figure 4-3)

Figure 4-1 Smart Array 5302 controller card

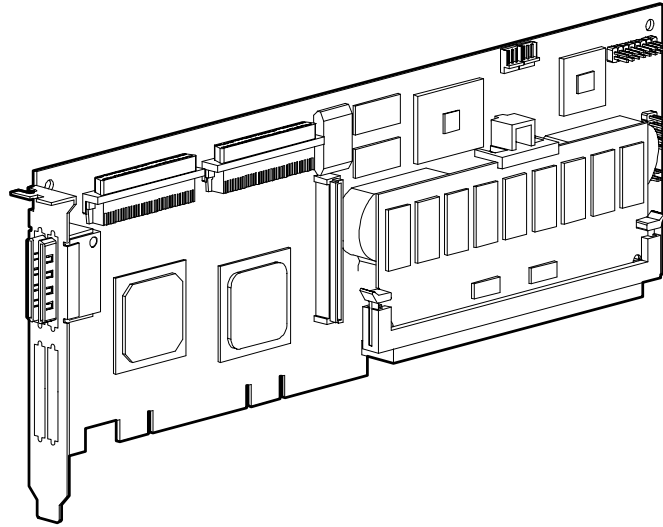


Figure 4-2 Smart Array 5304 controller card

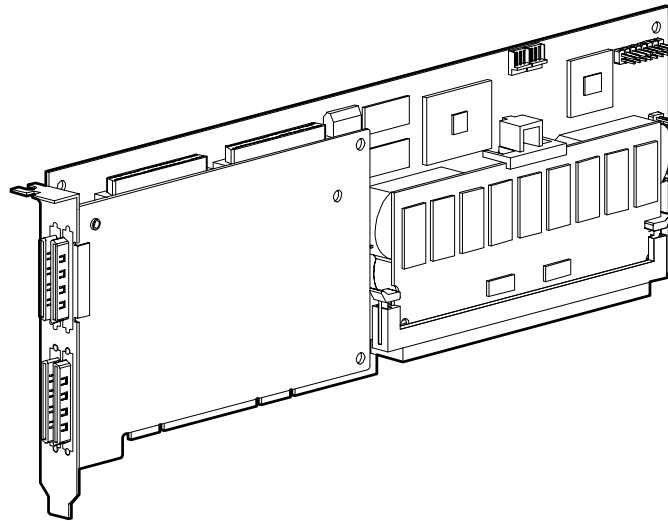
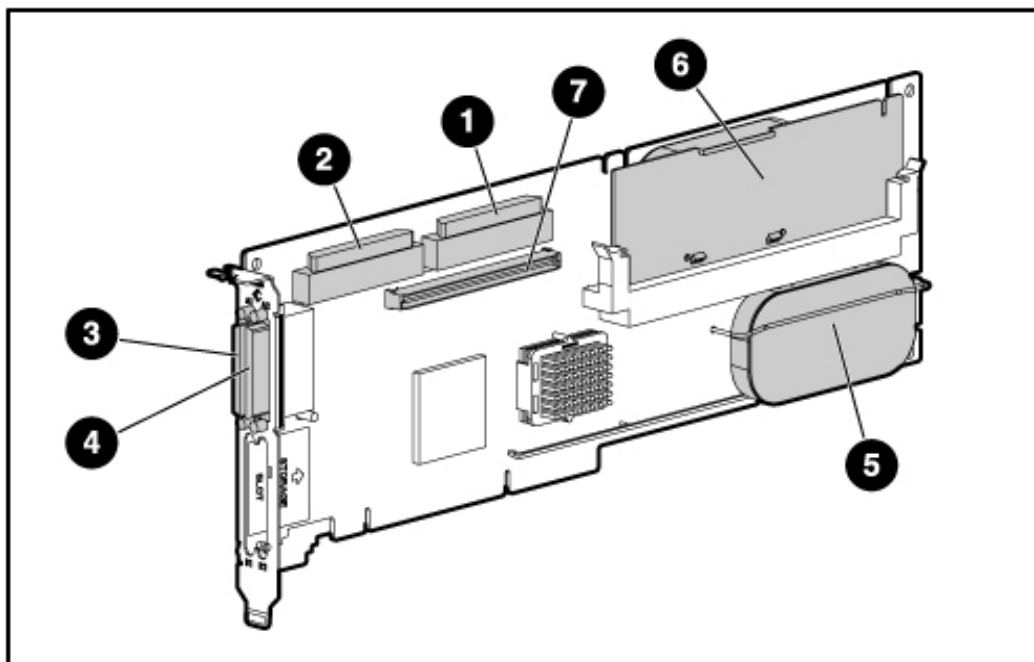


Figure 4-3 Smart Array 6402 controller card (6404 not shown)**Table 4-2**

Item ID	Description
1	Internal SCSI connector, port A1*
2	Internal SCSI connector, port A2*
3	External SCSI connector, port A1*
4	External SCSI connector, port A2*
5	Controller battery
6	Battery-backed cache module
7	Connector for expansion board
* NOTE: Do not use both connectors on a port simultaneously.	

NOTE

If an HP rx2600 server is ordered from the factory along with an internal RAID option (with the HP Smart Array controller card and extension cable A7231-63024 pre-installed), this extension cable connects the hot plug drives 0 and 1 to PORT 1 of the HP Smart Array controller card installed in PCI slot 3. The additional cable (A7231-63025) is placed in the server top tray. The internal hot plug drive 2 is still connected to the integrated SCSI controller.

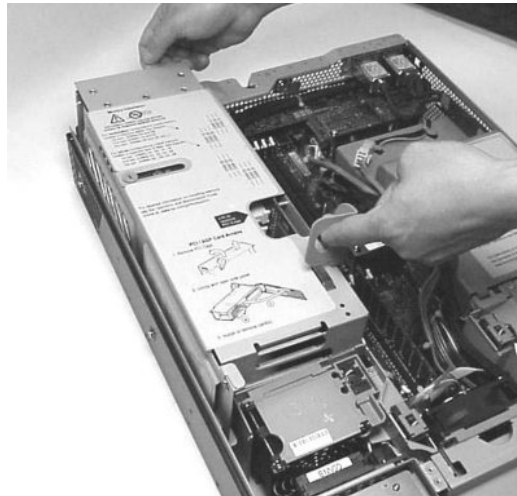
PORT 2 of the HP Smart Array controller card is still available to connect the external StorageWorks mass storage or internal hot plug drive 2. If the internal hot plug drive 2 is required for RAID, you will need to install cable A7231-63025 as described in the “Recabling for RAID” section later in this chapter.

If you opt to use both ports of the Smart Array controller card for your internal drives, you must purchase an additional HP Smart Array controller if you want external RAID mass storage.

Installing the HP Smart Array controller card

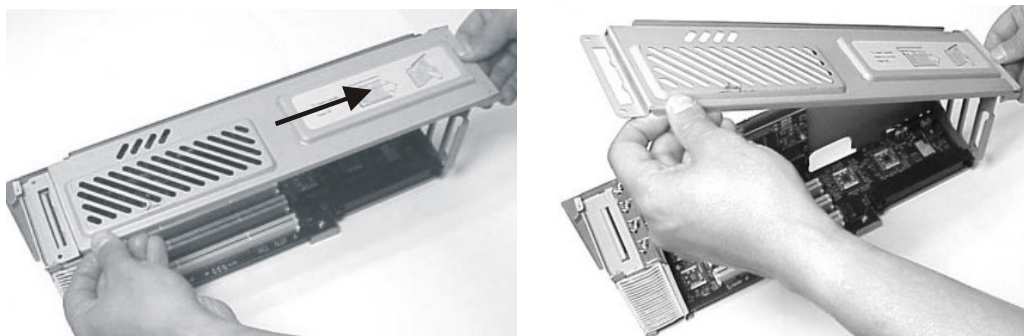
- Step 1.** If the server is running, shut down the OS, power off the server, and unplug the power cord.
- Step 2.** Remove the metal system cover as described in the server's operation and maintenance guide.
- Step 3.** Lift the PCI cage release lever along with the back edge of the PCI cage in order to lift the PCI cage out of the system. See Figure 4-4.

Figure 4-4 **Removing the PCI cage**



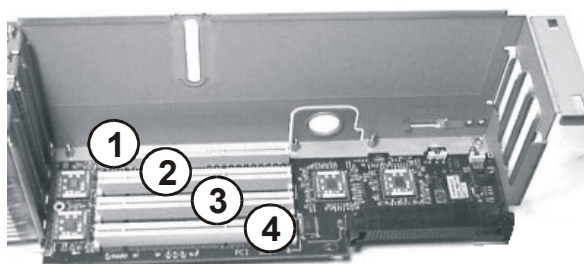
- Step 4.** Grasp the PCI cage cover and slide it away from the bulkhead end of the PCI cage. Lift the cover off the PCI cage as shown in Figure 4-5.

Figure 4-5 **Removing the PCI cage board cover**



- Step 5.** Install the HP Smart Array controller card in PCI Slot 3 (see Figure 4-6). This is required when connecting the HP Smart Array controller card to the internal hard disk drives.

Figure 4-6 **PCI card order**



- Step 6.** Proceed to the next section for cabling instructions.

NOTE Do not slide the PCI cage cover back onto the system at this point. You will do this later.

Recabling for RAID

If the HP Smart Array controller card is not pre-installed in your server from the factory, then the rx2600 internal hard drives are connected to the integrated SCSI controller with two internal SCSI cables attached to the system board and the hard drive backplane, as follows:

- One of the internal SCSI cables (p/n A7231-63017) connects to the CH A connector of the hard drive backplane, and is then routed and connected to physical drives 0 and 1 (see Figure 4-7 and Figure 4-8).

- The other SCSI cable (p/n A7231-63018) connects to the CH B connector of the hard drive backplane, and is then routed and connected to physical drive 2 (see Figure 4-7 and Figure 4-8).

Figure 4-7 **Default cabling for internal hard drives**

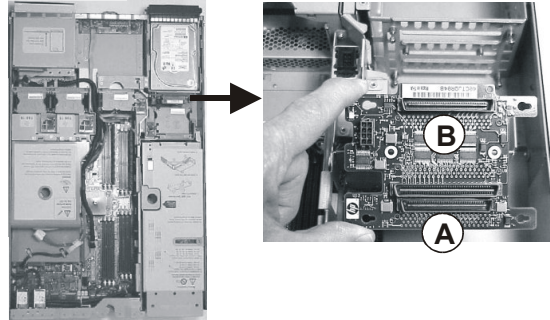


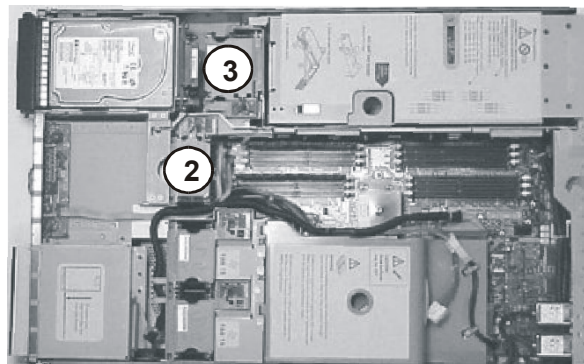
Figure 4-8 **Physical drive location (front of server)**



Your server's internal hard disk drives can be set up for single or dual channel RAID support. To use RAID with your server's internal hard disk drives, you must disconnect the internal SCSI cable(s) from their controller and the hard disk drive backplane (described below) and remove them from the system. Then you must connect the HP Smart Array controller card to the hard disk drive backplane using the supplied single channel cable or dual channel cable, as described below.

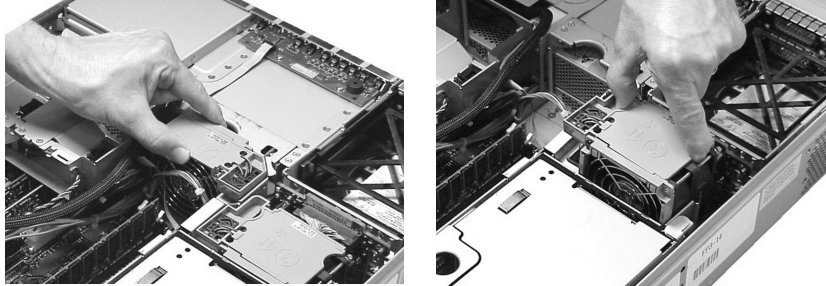
- Step 1.** To get access to the hard drive backplane and the internal SCSI cables, you must first remove fans 2 and 3. See Figure 4-9 for their location, then proceed to the next step.

Figure 4-9 **Location of fan 2 and fan 3**



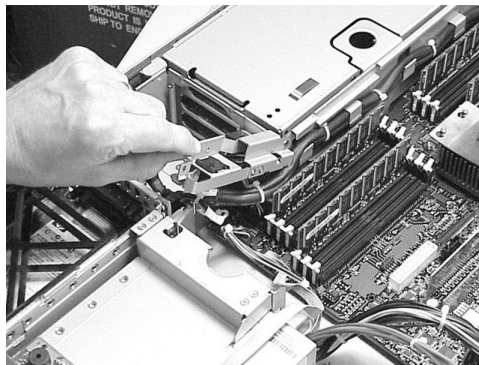
- Step 2.** To remove a fan, grasp the fan module with your index finger and thumb and lift it out of its slot. Note that each of the modules has indentations for grasping them with your index finger and thumb. See Figure 4-10.

Figure 4-10 **Removing the fans**



- Step 3.** To remove a SCSI cable, lift up on the fan power bridge as shown in Figure 4-11.

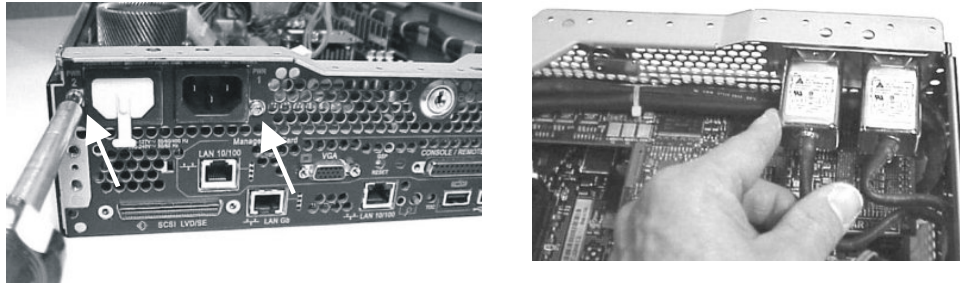
Figure 4-11 **Lifting the fan power bridge**



- Step 4.** Unplug one or both of the SCSI cables connected to the hard drive backplane (see Figure 4-7), depending upon whether you want to use one or both channels of the HP Smart Array controller card:
- Single channel: unplug backplane SCSI cable Channel A (bottom) connector
 - Dual channel: unplug backplane SCSI cable Channel A (bottom) and SCSI cable Channel B (top) connectors
- Step 5.** Remove any unused internal SCSI cables from the server. These cables are not terminated and cannot remain connected to the system board. To remove unused SCSI cables, you must first remove any DIMMs in memory banks A and B (closest to the PCI cage).
- Step 6.** Remove the ECI Management card by first disconnecting all power cables and any LAN or telecommunications cables.

- Step 7.** Use a T-15 torx driver to unscrew the two power connector mounting screws and remove the power connectors from the back of the system. See Figure 4-12.

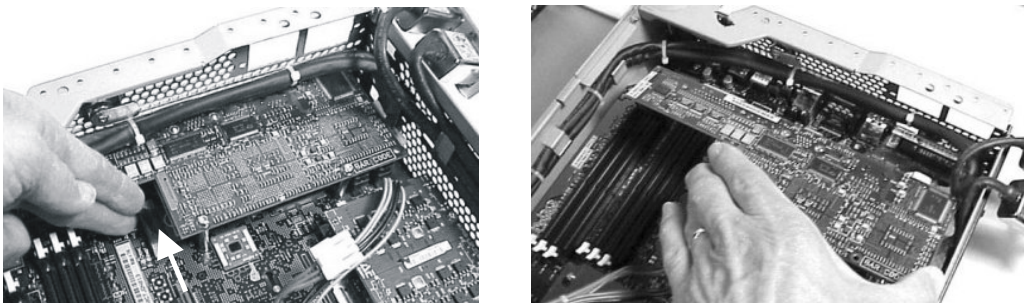
Figure 4-12 **Removing the power connectors**



- Step 8.** Next, disconnect the ECI Management card connector (orange). Before removing the card itself, the two screws holding it to the system motherboard must be removed. The screws are located on the far left and right sides of the card when viewed from the back of the server chassis. Also, two connector-screws for the 25-Pin Management Port located on the right end of the card (holding it against the back of the server chassis), must be removed before you can completely remove the card from the server.

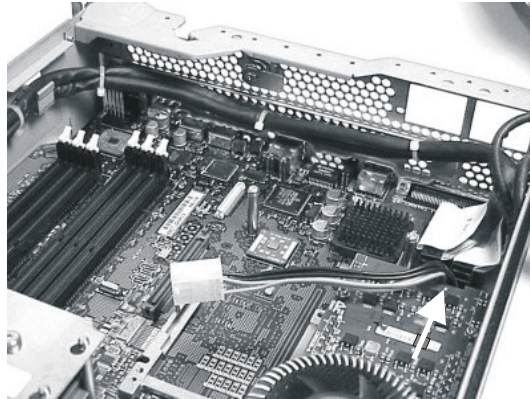
When all of the screws are removed, disconnect and remove the card by grasping it by the edges and pulling it out (see Figure 4-13). Then place the card on the anti-static bag that the controller card came in, to protect it from static electricity.

Figure 4-13 **Disconnecting, then removing the management card connector**



- Step 9.** Disconnect and remove any unused SCSI cables from the system board, as shown in Figure 4-14.

Figure 4-14 **Disconnecting, then removing unused SCSI cables from system board**



- Step 10.** Do *one* of the following, depending on whether you are configuring for a single or dual channel support:
- a. Single Channel Support:** For 5300 series cards, plug the end of the A7231-63024 single channel cable labeled “PORT 1” into PORT 1 of the HP Smart Array controller card. For 6400 series cards, plug the end of the A7231-63024 single channel cable labeled “PORT 1” into PORT A2 of the HP Smart Array controller card (see Figure 4-15). The cable connectors are marked for clarity. The excess cable goes between PCI slots 3 and 4 and part of the cable must be folded down (90 degrees). Be sure it lies flush against the HP Smart Array controller card to prevent it from obstructing access to the other PCI slots. The other part of the cable that is labeled Channel A (bottom) should exit the PCI cage flush against where the PCI board cover and cable channel will fit on the PCI cage (see Figure 4-17).

NOTE

Do not reinstall the PCI cage or plug the other end of the cable into the hard drive backplane yet. This is described later.

- b. Dual Channel Support:** For 5300 series cards, plug the ends of the A7231-63025 dual channel cable labeled “PORT 1” and “PORT 2” into PORT 1 and PORT 2, respectively, of the HP Smart Array controller card. For 6400 series cards, plug the ends of the A7231-63024 dual channel cable labeled “PORT 1” and “PORT 2” into PORT A2 and PORT A1, respectively, of the HP Smart Array controller card (see Figure 4-15). The cable connectors are marked for clarity. The excess cable goes between PCI slots 3 and 4 and part of the cable must be folded down (90 degrees). Be sure it lies flush against the controller card to prevent it from obstructing access to the other PCI slots. The other part of the cables which are labeled Channel A (bottom) and Channel B (top) should exit the PCI cage flush against where the PCI board cover and cable channel will fit on the PCI cage (see Figure 4-17).

NOTE

Do not reinstall the PCI cage or plug the other end of the cable into the hard drive backplane yet. This is described later.

Figure 4-15 **Single channel RAID cabling from a controller card installed in the PCI cage**

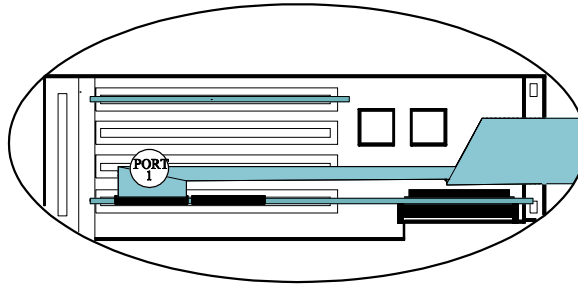
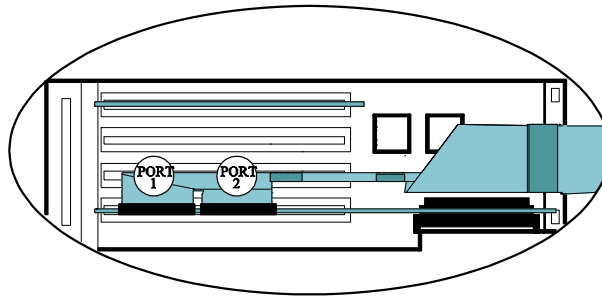
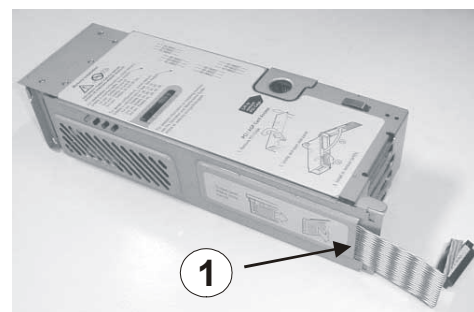
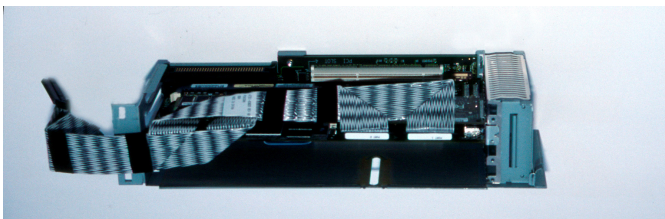


Figure 4-16 **Dual channel RAID cabling from a controller card installed in the PCI cage**



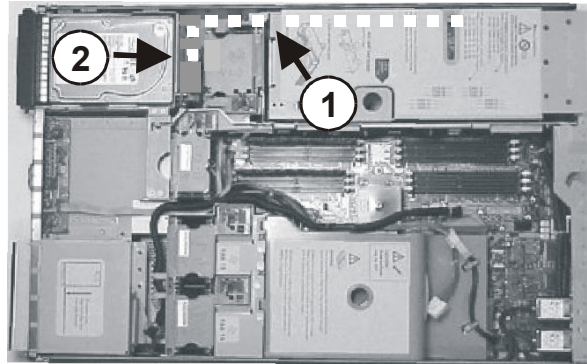
Step 11. Replace the PCI cage board cover, routing the RAID cable out of the cover's cable channel (see Figure 4-17). Note that the cable should be folded down flush against the controller card, with the latter half of the cable bent in order to exit through the cover's cable channel (see Item 1 in Figure 4-17).

Figure 4-17 **RAID cable routing through the PCI cage board cover**



- Step 12.** Place the PCI cage back into the system. Note that the RAID cable(s) must be flush against the server chassis as they exit the PCI cage cable channel (see Item 1 in Figure 4-18). Then they must be routed around the chassis side of fan 3 to the hard drive backplane (see Item 2 in Figure 4-18) to avoid crimping.

Figure 4-18 RAID cable routing through the PCI cage board cover



- Step 13.** Connect the free end(s) of the RAID cable(s) from the controller card to the backplane. The cable connectors are marked.
- Step 14.** Reinstall the management card and power supply connectors.
- Step 15.** Reinstall any DIMMs that were removed back into their memory banks.
- Step 16.** Lower the fan power bridge.
- Step 17.** Reinstall fans 2 and 3.
- Step 18.** Close the server.

Configuring the server firmware and software for RAID

To complete the installation and set up RAID for your server's internal hot swap drives, follow the procedures given in the *HP Smart Array Controller User Guide*:

- Configure your HP Smart Array controller card in an HP Integrity server (use HP Smart Array utilities and command line options from the EFI shell)
- Install and use the operating system-specific HP Smart Array utilities and software that help you manage your RAID
- Configure the HP Smart Array controller card for an external RAID storage system

5 Cabling for the HP Integrity rx1620 Server

This chapter describes how to connect the cables of an HP Smart Array 6402 or 6404 controller card to the internal hard drives of an HP Integrity rx1620 Server.

NOTE These instructions do not apply if you are connecting the controller card to an external mass storage box. Refer instead to the *HP Smart Array Controller User Guide* that shipped with your card.

The Smart Array 6400 series of controller cards includes two models: the 6402 and the 6404. Model 6402 has two Wide Ultra320 SCSI channels and 128 MB of cache. Model 6404 has four Wide Ultra320 SCSI channels and 256 MB of cache.

The product numbers and descriptions for these two cards are summarized as follows:

Table 5-1

Controller	Product Number	Description
SA6402	A9890A	2 channel / 128 MB cache
SA6404	A9891A	4 channel / 256 MB cache

Before you begin, you will need:

- cable kit (part number: A7027-63001)
- T-15 Torx driver
- 3/16-inch hex driver
- the Smart Array controller card (see Figure 5-1)

Figure 5-1 Smart Array 6402 controller card (6404 not shown)

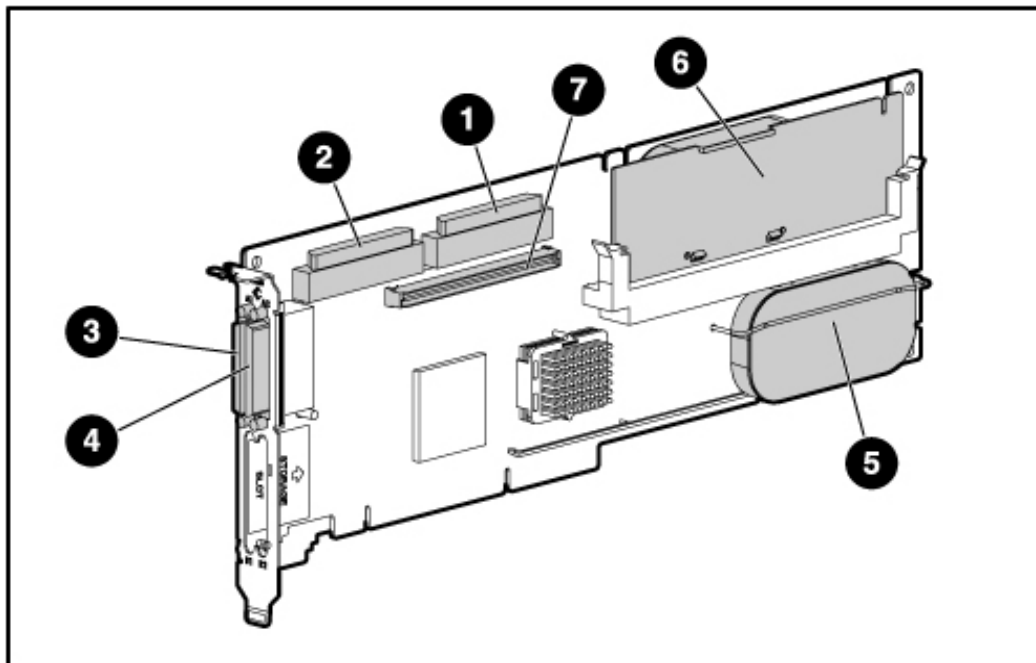


Table 5-2

Item ID	Description
1	Internal SCSI connector, port A1*
2	Internal SCSI connector, port A2*
3	External SCSI connector, port A1*
4	External SCSI connector, port A2*
5	Controller battery
6	Battery-backed cache module
7	Connector for expansion board
* NOTE: Do not use both connectors on a port simultaneously.	

Installing the HP Smart Array 6402 or 6404 controller card

In this procedure, the existing SCSI cable connected to the Channel A connector on the system board is relocated to the Channel A connector on the Smart Array controller card installed in slot 1 (full-length slot) of the PCI cage. Then the SCSI cable is routed from the PCI cage under the power supply bracket and over the IDE cable (if installed) without blocking the air flow of the chassis fans.

- Step 1.** If the server is running, shut down the OS, power off the server, and unplug the power cord.
- Step 2.** Remove the top cover of the server.
- Step 3.** Disconnect the SCSI cable from the Channel A connector on the system board by pulling on the cable release strap. See Figure 5-2.

NOTE

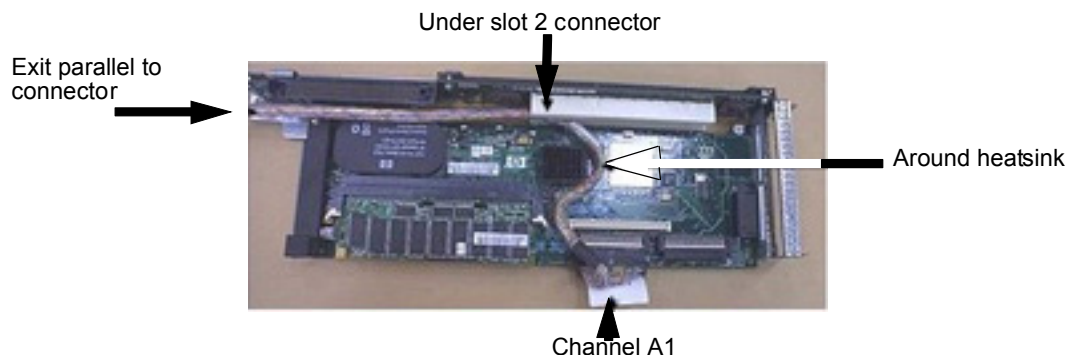
If an optional management processor card is installed in the server, follow the instructions provided in the server's Operation and Maintenance Guide to remove the card, allowing access to the Channel A connector. Then reinstall the card after the SCSI cable has been disconnected.

Figure 5-2 SCSI channel A connector on system board



- Step 4.** Remove the PCI cage from the server.
- Step 5.** Remove any accessory cards installed in PCI slot 2 (half-length slot).
- Step 6.** Install the HP Smart Array controller card in PCI slot 1 (full-length slot).
- Step 7.** Orient the PCI cage with the installed card component-side-up to allow routing of the SCSI cable. See Figure 5-3.

Figure 5-3 Cable routing on Smart Array card and PCI cage



- Step 8.** Attach the SCSI Channel A connector (previously removed from the system board connector) to the A1 Channel of the controller card.
- Step 9.** Route the SCSI cable around the heatsink on the controller card and under the edge of the PCI slot 2 connector. See Figure 5-3.

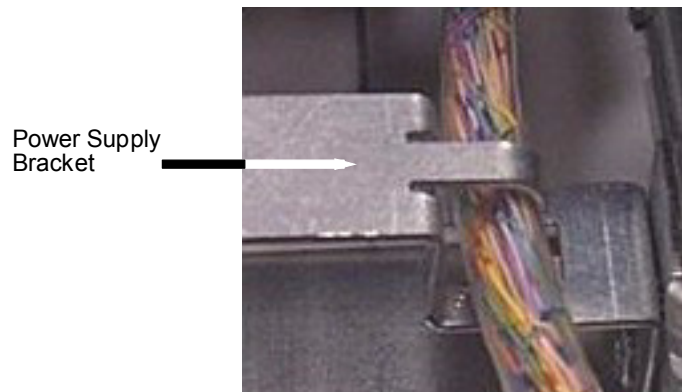
Step 10. Continue routing the cable parallel to the connector edge of the PCI cage.

Step 11. Reinstall any accessory cards previously removed from PCI slot 2.

Step 12. Install the PCI cage into the server chassis.

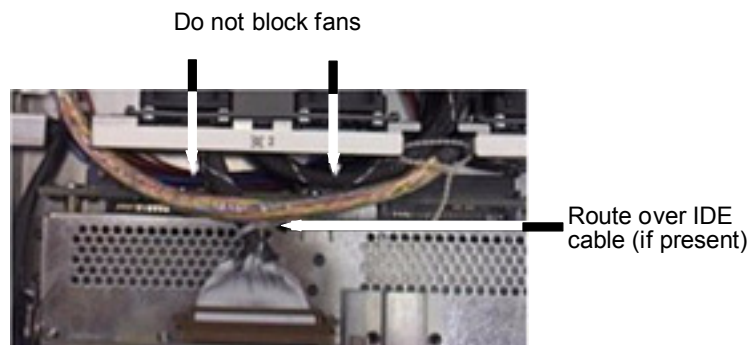
Step 13. Route the SCSI cable under the power supply bracket. See Figure 5-4.

Figure 5-4 Cable routing under power supply bracket



Step 14. Route the SCSI cable through the access slot of the fan assembly to the connector on the SCSI backplane. See Figure 5-5.

Figure 5-5 Cable routing at SCSI cage



Step 15. Complete the installation by following the instructions provided in the *HP Integrity rx1600 Operation and Maintenance Guide* for closing up the server, installing it in a rack, and powering it up. To enable RAID, refer to the controller card documentation.

